

# Precision measurement of the ratio of the electric and magnetic form factors of the neutron with polarized $^3\text{He}$ using CLAS

V. Boykin, J. Calarco, D. DeAngelis, J. Distelbrink,  
L. Gelinas, J. Heisenberg, F. W. Hersman, M. Kennedy,  
V. Pomeroy, Timothy P. Smith, I. The, A. Tutein  
*University of New Hampshire*

M. B. Leuschner  
*Indiana University*

V. Burkert, B. A. Mecking, E. Smith  
*CEBAF*

J.-M. Laget  
*Saclay*

and the CLAS Collaboration

F. W. Hersman, Timothy P. Smith, contact persons

## ABSTRACT

We propose to measure the polarization response of  $^3\vec{\text{He}}(\vec{e}, e'n)$  in the quasielastic region to extract the neutron electric to magnetic form factor ratio ( $G_E^n/G_M^n$ ) with CLAS. We present a plan to adapt existing techniques for polarizing helium by alkali spin exchange for use in the CLAS. The anticipated precision in the ratio corresponds to an uncertainty of 0.002 in  $G_E^n$  at low momentum transfer, and approximately 0.010 at 3 GeV/c<sup>2</sup> (in four-momentum bins of  $\Delta Q = 0.2$  GeV/c).